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DEPARTMENT OF ECOLOGY

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Environmental Cleanup Office

April 24, 1998

Mr. Peter Malsch  
Senior Environmental Manager  
Weyerhaeuser  
CH 1K29  
PO Box 2999  
Tacoma, WA 98477-2999

RE: Remedial Investigation and Feasibility Study Work Plan  
Chlor-Alkali Plant – Longview, Washington (CH2MHill, May 1995)

Dear Mr. Malsch:

As per my commitment during our initial meeting in February, I am commenting on the document noted above. Generally, I found the RIFS Work Plan (Work Plan) to be very comprehensive, complete, and easy to review, offering little scope for comment. I commend Weyerhaeuser and its consultants for a thorough job.

**Work Plan Comments (keyed to relevant sections):**

**5.2.1; page 5-3**

*"A pronounced reduction in mercury adsorption occurs at lower pH in the presence of chloride..."*

**5.2.2; page 5-4**

*"The mobility of inorganic mercury in the unsaturated zone is expected to be low, except in areas where chloride is present and pH is high."*

*"...the mobility of other forms of dissolved inorganic mercury will be enhanced by chlorides and high pH."*

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While quoted somewhat out of context, the excerpt from section 5.2.1 above appears to contradict the two excerpts from the following section (5.2.2). The mobility of mercury is complex and controlled by a variety of factors including pH, oxidation-reduction state, adsorptive sites containing organic carbon and/or iron oxides in the soil and aquifer matrix, and—importantly in this case—the presence of chloride (Cl<sup>-</sup>) ions. However, with some exceptions, mercury mobility in a dissolved phase tends to increase as pH is depressed.

6.1.3; page 6-7

The Work Plan recommends additional sediment sampling be conducted in the stormwater drainage ditch and notes that affected sediments there may contain organic as well as inorganic mercury forms. The Work Plan then maintains “...*it is not necessary to differentiate between these forms...*” based on (human) exposure routes and IRIS risk information.

While on-site human exposure to the sediments—either in the ditch or the river adjacent—is probably of low concern, the methylmercury (organic) forms possibly present in those sediments are especially toxic, mobile, and bioaccumulate readily, posing a risk to the major environmental receptor for this site, the Columbia River. Remedial investigation for at least one other Chlor-Alkali facility in western Washington (ENSR, 1994) has included mercury speciation studies to characterize possible risk and aid the development of remediation strategies. Would it not be helpful to characterize the contaminant form(s) as part of the sediment “nature and extent data” category?

7.1.2; page 7-7

Near the end of a discussion of the hydraulic properties, connection, and response in the local alluvial and basalt aquifers, the Work Plan states: “*This response [between basalt groundwater levels and tidal river stage fluctuations] may suggest that a poor hydraulic connection exists between the two systems or that there is good hydraulic connection but low basalt permeability.*” Further, “...*low groundwater flux [from the basalt] into the river*”, and “...*apparently limited hydraulic connection of the [basalt] groundwater zone with the Columbia River... [suggest] that mercury discharge ...into the river is not significant.*”

Precluding possible contaminant flux into the river via flow in the basalt may be premature. The HLA groundwater characterization (1991) found an interconnection between saturated alluvium and basalt during aquifer testing despite dissimilar hydraulic conductivities. Groundwater flow in the basalt is apparently controlled by the degree and nature of fracturing. Flow would be complex and non-linear compared to flow in the granular alluvial materials, but hydraulic connection with the river to some degree should probably be assumed. Given the unknown fate and transport of mercury in the basalt, this possible pathway to the river should not be discounted.

7.4.7; page 7-16

It is implicitly or explicitly assumed throughout the Work Plan that the principal environmental receptor at the site is the Columbia River. *"If...the Columbia River is included in a confirmed [contaminant] pathway as a result of completion of the RI, an environmental assessment will be performed."* Given the principal pathway for contaminant flux off-site is almost certainly shallow groundwater, and that groundwater is in hydraulic connection with the river, it is probably logical to pre-suppose an environmental assessment which includes the river will be necessary.

### Section 8

I presume the project schedule will be revised to reflect new timelines and milestones.

### References

ENSR Consulting and Engineering. *Chlorine Plant Remedial Investigation*. Georgia-Pacific Corporation, Bellingham, Washington. July 1994.

Harding Lawson Associates (HLA). *No. 1 Cell Room Groundwater Characterization Report*. Weyerhaeuser Company, Longview, Washington. August 1991.

Please contact me at (360) 407-6388 if I may answer questions about these comments or Ecology's involvement with this project.

Sincerely,



Cris Matthews  
Regional Hydrogeologist  
Solid Waste & Financial Assistance Program

cc: Monica Tonel, US EPA Region 10